

Early-life behavioural development of lines divergently selected on feather pecking behaviour

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The behavioural development of an animal is affected by the interplay between its genetic background and its environment. In laying hens, feather pecking is a damaging behaviour that involves pecking and pulling at the feathers or tissue of conspecifics, negatively affecting welfare. Feather pecking is a heritable trait, but its development can be affected by many factors, including environmental factors. In order to better understand the development of this damaging behaviour, we characterised the early-life behavioural development of lines selected both for and against feather pecking. We used genetic lines selected for high (HFP) and low (LFP) feather pecking and an unselected control line. Lines were housed separately in groups of 19 birds per pen, with 8 pens per line. Group size was reduced by 2-3 birds at 0, 5 and 10 weeks of age. There were two batches that differed two weeks in age. Birds were tested at 0 and 10 weeks of age in a novel object test, at 4 weeks of age in a novel environment test and at 15 weeks of age in an open field test. Data were analysed using mixed models, with selection line as fixed factor and pen nested within batch as random factor. When data were not normally distributed the non-parametric Kruskal Wallis test was used. HFP birds had a shorter latency to approach the novel object compared to LFP and control birds at both 0 weeks of age (HFP=36 s, LFP=120 s and control=117.5 s, $F_{2,20}=36.52$, $P<0.0001$) and 10 weeks of age (HFP=16.88 s, LFP=79.75 s and control=61 s, $F_{2,20}=12.60$, $P=0.0003$). Furthermore, HFP birds had a shorter latency to vocalize compared to LFP and control birds at both 4 weeks of age (HFP=5.48 s, LFP=15.16 s and control=16.2 s, $X^2_2=42.23$, $P<0.0001$) and 15 weeks of age (HFP=26.34 s, LFP=50.27 s and control=37.63 s, $X^2_2=15.59$, $P=0.0004$). Thus, based on these three tests, HFP birds were less fearful at all studied ages compared to control and LFP birds. In addition, HFP birds showed a more pro-active coping style than control and LFP birds. In conclusion, our results suggest that selection for feather pecking affects early-life behavioural characteristics. These results can help to better understand the development of feather pecking behaviour, and possibly to identify early-life behavioural characteristics as potential indicators of feather pecking.